In the Matter of Broadband Business Industry Practices
WC Docket No. 07-52

Comments by Steven Titch, Senior Fellow for IT and Telecom Policy at The Heartland Institute and Telecom Policy Analyst, The Reason Foundation.

Mr. Chairman and Honorable Commissioners:

My name is Steven Titch. I currently hold positions as Senior Fellow for IT and Telecom Policy at The Heartland Institute and Telecom Policy Analyst, The Reason Foundation. Both are not-for-profit research organizations dedicated the study and implementation of free-market ideas. I have more that 25 years of experience covering telecommunications industry and policy, during which I have watched the evolution of this industry from regulation and monopoly to deregulation and competition. I have witnessed and reported on the growth of personal communications technology and the Internet. My previous positions include Editorial Director of Telephony Magazine, Midwest Bureau Chief at Communications Week and Editor of Cellular Business magazine.

Under the guise of encouraging competition, protecting consumers and preserving First Amendment freedoms on the Internet, a coalition of corporations and organizations, representing all parts of the political spectrum, has been urging the Federal Communications Commission, Congress and even state legislatures to adopt laws that would regulate the business practices of companies that are part of the broadband information supply chain. Chief among these efforts has been a push to create laws that regulate how owners of transmission facilities and owners of Web content can voluntarily enter into business agreements to optimize the performance of sophisticated Web-based applications for end-users. The pressure for these regulations has come under the larger banner of "network neutrality."

Certain provisions of network neutrality, if enacted, would impose obligations and prohibitions on major service providers that own the networks that connect homes and businesses to the Internet.

For review, the principles of network neutrality, all contained in The Internet Freedom Preservation Act (S. 215) pending in Congress, are:

- Carriers should be prohibited from blocking access to any legal Web site or application;

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- Carriers should be prohibited from preventing any application using the Internet Protocol (IP), the basic programming language used on the Internet, to run on its network;

- Carriers must allow any IP-addressable device to attach to the network;

- Carriers must provide users with information about their network service plan information;

- Carriers should treat all data the same and be prohibited from altering, prioritizing or partitioning data with the intent of improving quality for their own services or for a select group of customers or partners.

The first four principles are non-controversial, and were codified by the FCC in 2005. There has been only one instance of a U.S. service provider blocking a Web-based application, the well-publicized case of tiny Madison River Communications preventing customers from using Vonage's Internet calling service. The FCC forced Madison River to halt the blocking and make a $15,000 payment to the U.S. Treasury as part of an agreement to drop the investigation.[1] There has been no reported incident of a service provider violating the other tenets.

The fifth principle, which is not part of FCC policy, but contained in The Internet Freedom Preservation Act, holds serious consequences for all Internet users in that it introduces government regulation to the Internet. The fifth principle of network neutrality would impose limits on how service providers can use their networks to improve the quality, reliability, prioritization and management of data and applications as they move across their facilities. Specifically, phone, cable companies, and, possibly, large ISPs such as EarthLink and Covad, would be prohibited from offering Web site owners (sometimes called Web hosts), ranging from companies the size of Google to small entrepreneurial Web storefronts, any improvement in applications speed or performance for an added price.

Service providers who own the nation's networks—companies such as AT&T, Verizon, Comcast and EarthLink—would not be allowed to prioritize transmission of certain types of data, for example, streaming video or online gaming, even if the application would perform better with such prioritization. They would not be allowed to enter agreements with third party providers to give their services special handling. They would not be permitted to improve

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[1] Federal Communications Commission, "Consent Decree in the Matter of Madison River Communications LLC and Affiliated Companies," DA-05-543, p.2.

the quality of their own services, such as Voice over Internet Protocol (VoIP) phone calling, without providing the same level of quality to competitors who use their network.

What I present here is a case against the regulation or prohibition of business, contracts, agreements and transactions between Internet service providers and third party providers who seek to maximize the performance of their Web-based applications and services.

Enforced network neutrality would add an unprecedented level of government interference in the way the Internet applications work, and to what extent the sophisticated transmission mechanisms within the Internet could be used facilitate future Web applications such as telemedicine and distance learning, as well as entertainment, e-commerce. And even then, it is doubtful whether network neutrality can ensure "equal access" proponents say they want. It is also questionable as to whether a policy of network neutrality is either workable or desirable within the environment of today's Internet.

The Common Carrier Argument

The case for regulation is built entirely on supposition that a non-neutral Internet is bad for consumers. This is inherent in the simple fact that network neutrality legislation does not aim to correct any neutrality abuse that exists. Even as proponents concede that although neutrality elements are breaking down, they can't point to a specific instance of consumer or business harm through applications prioritization or quality guarantees.

Thus the fallback position is argument that network service providers are common carriers and, therefore, are obligated to be neutral.

But legislators and regulators should be careful about attempts to impose aspects from common carrier history on the delivery of services and applications via the Internet.

Participants on all sides of the debate are fond of extending common carrier analogies to the Internet. The Internet is like the highways, they say. Or the Internet is like the railroads. Or the Internet is like electricity and water.

There are similarities, to be sure. But perhaps it is more important to spotlight the differences, especially before embarking on a regulatory course that relies too much on common carrier analogies.

Data bitstreams—and the networks they travel—are different from railroads and electric grids. Unlike cargo, packets of information do not exist in physical space. They can move around the world at the speed of light via any number of routes at very little cost. Neither are they are like electricity or water. Data is not consumed. On the contrary, data can be stored, copied, and the same data can be repeatedly accessed and used.

Also unlike water or electricity, data has value that transcends its form. Like your chemistry teacher would say, water is a stream of H_2O molecules in liquid state. It is used as such, for drinking, cooking and bathing. Electricity is simply a stream of electrons delivered (in North America) at an alternating current at 120 volts, for which all home electric appliances must be designed.

Data consists of binary electronic or optical pulses—ones and zeros. However, they have independent value that derives from the content or application that all those ones and zeros represent when processed by the right equipment or software. Routers, PCs and other information appliances in the home or workplace are designed to take specific data and convert it into something of value that transcends its base digital format. By themselves, ones and zeros are useless. If you've ever tried to open use Microsoft Word to open a Word Perfect document, this point is all too clear.

Network neutrality is flawed because it fails to account for the simple fact that users approach the Internet as a transport media for content and applications, not raw data. By insisting that all data be treated the same way as it crosses the network, it fails to recognize the value of the content and application contained in the bitstream. This is the grand irony of network neutrality: Since the Internet was conceived, computer scientists, inventors and entrepreneurs have been working to make it as robust as possible in the diverse content and applications it can handle. Service providers have a role here, because their networks contain intelligence that can be used to shape and improve applications. Network neutrality would pre-empt this.

Given the capabilities broadband networks offer, regulators must ask whether it is truly in the public interest to hold carriers to a strict doctrine of non-discrimination. There has been no instance of carriers using network intelligence to block or interfere with competitors. True, they are using their proprietary resources to offer a level of service for those with the means to pay, but this is not inherently unfair. In any other industry—including information technology—the idea of creating pricing tiers for "good, better and best" is a legitimate business practice. Indeed, service providers today provide, on a sliding rate scale, offer classes of service to enterprise customers that guarantee specific and measurable quality of service (QoS) levels.

Network neutrality proponents have not shown that the sale of QoS tiers leads to consumer harm. On the contrary, if bundling MSN and Google on a portal page leads to increased sales for all parties, or market research data shows that consumers want to receive services this way—as it has in the past—it refutes the exploitation argument.

The End of the Local Exchange Bottleneck

Another position among net neutrality proponents is that service providers "control" the local bottleneck and are therefore in a position to act as arbitrary gatekeepers of Web content. They say that because most markets have but two broadband service providers—a phone and cable company—an exploitive duopoly exists with unchecked power to use quality and optimization services determine "winners" and "losers" among Web applications providers.

But telephone and cable companies do not monopolize Internet services, especially at the server side, where the market for optimization truly exists. A hosting company or business has an enormous choice of carriers from which it can purchase capacity. These include the local phone company but also firms such as Level 3, Covad Communications, McLeodUSA, 360Networks and Cogent.

In this environment, AT&T and Comcast have no duopoly to leverage. If they were able to offer quality optimization in the free market, as a baseline, they would still have to be competitive with network optimization services from companies like Akamai and Savvis (see section below). If customers thought they were being exploited, they could switch carriers or adopt a server-based solution.

On the customer access side, competition has been the rule for ISP services since the market's inception. Albeit many ISPs leased lines from local phone companies, that is not the case now. Facilities-based competition—cable modems vs. DSL—has reached most markets. Finally, although not as robust as wireline platforms, wireless access is making legitimate market inroads as an economical Internet access mechanism. Wireless services can be purchased for as little as $20 a month. Working in partnership with cities (and sometimes on their own), EarthLink, Google and MetroFi are experimenting with free wireless business models. To be sure, Verizon and AT&T offer wireless services, they are not alone. In addition to the three players mentioned, other national competitors include T-Mobile and Alltel. Plus there numerous regional and local wireless ISPs.

Non-Neutral Internet Technology

Groups seeking regulation often talk in terms of "preserving" of "returning to" an environment of network neutrality. Whether such an environment ever truly existed is arguable. Maybe it was the case in the Internet's earliest days, when data was largely text and commands were often long strings of characters that forced even experienced programmers to place handwritten cheat sheets alongside their keyboards. If this indeed was network neutrality, programmers and users have been trying since Day One to get away from it. When the Internet browser was invented and gave Web site programmers a tool present information in the forms of pictures, graphics, audio and (eventually) video, you could argue that network neutrality ended--for the better.

Bandwidth

Still, let's start with something as simple as bandwidth. Internet bandwidth, measured in terms of kilobits and megabits per second, affects the quality of the Internet experience. Internet access is not neutral. Those who can afford more bandwidth get a better experience. Wireless access at 1 Mb/s can cost as little as $15 a month. Most telephone companies sell DSL service in bandwidth tiers, from 1 Mb/s to 3 Mb/s, ranging from $25 to $50 a month. Cable modems, which can deliver up to 6 Mb/s, top out at about $60 a month. The consumer's choice of bandwidth balances budget and needs. But there is a clear difference in quality in video received at 600 kb/s and at 4 Mb/s.

Web site owners have the same cost choices and trade-offs. Someone with a small business, or a simple blog, may elect purchase shared bandwidth capacity from a local ISP. A person or company doing regular business may elect to own a server with a leased T-1 (1.5 Mb/s) connection. Sites that must handle a great deal of traffic, may have multiple T-1s or even T-3s (45 Mb/s). Again, the amount of bandwidth the customer is willing to purchase affects the performance of the Web site. Wealthier customers can afford to purchase greater amounts of bandwidth. There is no law, nor should there be, limiting every Web site to a fixed amount of shared bandwidth on the rationale that not everyone can afford a T1.

Personal Computers

PCs have as much a role in the quality of the Internet experience as servers and software. The user may have a 100 Mb/s connection, but it would hardly matter if her PC used a 300-MHz processor, relied on a 200-megabyte hard drive. This wouldn't be enough processing power, speed or storage to make use of the applications that the high-speed connection would offer. A faster processor, a more sophisticated operating system and higher capacity storage

all carry higher costs. These same factors affect the server side. The individual seeking a Web presence is faced with number of choices, each carrying a corresponding difference in price. Shared space, or a dedicated server? Unix or Windows NT?

Again, individuals and enterprises with greater resources can use those resources to create a superior Internet experience. As with bandwidth, no one is demanding Congress set limits on the power and capabilities of PCs and servers that connect to the Internet. Nor should they.

Discriminatory networks within the Internet

The use of networked servers in applications delivery is a sophisticated technology concept, but is important to understand because it demonstrates that a legitimate and thriving market for content and applications prioritization exists.

It is generally considered that Ed Whitacre, CEO of AT&T, touched off the current net neutrality debate, when he said of Internet content providers: "They use my lines for free -- and that's bull. For a Google or a Yahoo or a Vonage or anybody to expect to use these pipes for free is nuts!"[2]

Some saw these assertions as a telephone company effort to somehow force Internet content providers to pay for something they shouldn't have to. In truth, companies can, and do pay vendors to improve delivery and performance of their Web-based content.

Akamai Technologies is the global leader in providing for accelerating content and business processes online. It operates a network of some 15,000 servers worldwide. Its Web site[3] touts some of the most, dare we say, deep-pocketed, corporations in the world—IBM, Apple, Audi, the European Broadcasting Union and, according to a recent press release, Sony Consumer Entertainment (SCE).

> In addition to providing cutting-edge delivery services to Japanese companies that offer online game content, such as SCE, Akamai's global platform is being leveraged in Japan to drive the commercial use of the Internet – in an era of rich content – by providing delivery services optimized to meet the particular needs of companies in a variety of fields including image-delivery services, financial services, food and beverage services, cosmetics, and multimedia…Akamai's dynamic content delivery

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[2] Business Week, "At SBC, It's All About 'Scale and Scope,'"Nov. 7, 2005, available at http://www.businessweek.com/magazine/content/05_45/b3958092.htm?chan=search
[3] www.akamai.com.

capabilities also ensure high performance and reliability of dynamically-rendered, personalized Web content.[4]

While Akamai is a leader, it is not alone in this market. Competitors include Kontiki Inc. (now owned by VeriSign), Mirror Image Internet and Savvis. Large content and applications providers purchase their technology and services to make their Web sites function better. In essence, these companies create tight-knit server networks within the larger Internet that partition off these bandwidth-rich, error-sensitive applications—exactly the type of service that AT&T's Whitacre was excoriated for proposing.

Remember, the basic premise for network neutrality is that the Internet, by nature, is neutral and that allowing service providers to monetize their ability to optimize applications somehow corrupts its essential nature. That Akamai and companies like it have made a successful business out of content and applications optimization is just another fact that belies this assertion. Further, it validates the statements from telephone company executives who say they have a right to demand compensation from companies for the extra cost of managing the transmission of profitable applications they seek to cram down their networks.

Non-Neutral Business Models

The examples up to now have shown ways that the technology and services within the Internet are non-neutral. But since network neutrality seeks to regulate business relationships—Section 12., Paragraph (4)(B) of The Internet Freedom Preservation Act prohibits service providers from giving favorable terms and conditions to subsidiaries, partners and other third parties with whom it might form a contractual relationship—it is worth showing how many of today's Internet business models are non-neutral.

The use of a partnership or agreement to gain a competitive advantage is established business practice, no less so on the Web.

For example, in May 2006, The Wall Street Journal reported that Yahoo agreed to be the exclusive third-party provider of all graphical advertisements on the eBay site. For Yahoo, it's a big win against Google, its major competitor.[5]

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[4] Akamai Technologies Press Release, "Akamai Content Distribution Infrastructure Adopted in Playstation Network," Dec. 19, 2006; available at http://www.akamai.com/html/about/press/releases/2006/press_121906a.html.
[5] Kevin J. Delaney, Mylene Mangalindan and Robert A. Guth, "New Tech Alliances Signal More Scrambling Ahead," The Wall Street Journal, May 26, 2006; available at http://online.wsj.com/article/SB114855928978662961.html?mod=technology_main_whats_news.

Under the Yahoo-eBay arrangement, if you want an ad on eBay, you've got to broker it through Yahoo. But network neutrality would prohibit service providers, which own the pipes which carry Yahoo's and eBay's paid advertising, from using similar business models to expand their own broadband opportunities.

The policy contradiction can be grasped further down in the story. The Journal reports that the two companies will work together to develop "click-to-call" advertising technologies, which will allow a user to click on an ad banner and trigger a VoIP call to the advertiser. This is the exact type of application that can benefit from a level of management above and beyond "best effort" Internet, but that network neutrality would thwart. While a network neutrality law would allow Yahoo to be the exclusive provider of eBay ads, it would prevent a phone company from joining the agreement to guarantee the connection and quality of the VoIP traffic for those click-to-calls. Hence, an opportunity to improve the online experience for consumers through innovative combination of technology and respective core company strengths is regulated away.

Elsewhere, eBay provides another example of preferential treatment in the Internet business model. Last year, a week after Google launched Google Checkout, a third-party funds transfer system, the auction site banned it because it was competitive with PayPal, the funds transfer service eBay owns.[6]

The move was not popular. eBay already collects a 5.25 percent fee[7] on products sold through its site. Add to that insertion fees, reserve fees and final value fees, not to mention the transaction fee its PayPal unit collects on every transaction, and you see why eBay's relationship with many merchants (especially small ones) has soured. The Google Checkout ban, which will be most strongly felt by these same merchants, won't help. Already some (regrettably) are calling for antitrust suits.

Nonetheless, it raises another argument against neutrality regulation—competition itself is a check on attempts to abuse market power. Consumers accustomed to a lot of Internet freedom resent constraints. It remains to be seen whether eBay will get away with this. It's not the monopoly some outraged users think it is. Google, Yahoo and Amazon are chomping at the bit to get a share of eBay's action. This may be a boost they need. For eBay, at best, it remains an experiment. By the early reaction, it looks like it may fail.

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[6] Eric Bangeman, "eBay Says No to Google Checkout," Ars Technica.com, July 6, 2006; available at http://arstechnica.com/news.ars/post/20060706-7203.html.
[7] For a schedule of eBay fees, see http://pages.ebay.com/help/sell/fees.html.

The "Exaflood"

Finally, regulation of Internet transmission quality could mean the loss of important tools to manage the explosive growth of data now riding the Internet.

Video has become standard feature on most news sites, from CNN to the news page for your local network affiliate. More than 100 million YouTube videos are being downloaded every day. Even small blogs carry video.

The video explosion has touched off discussion on how the nation's collective network infrastructure will handle the "exaflood"—the near exponential growth of Internet traffic from year to year.

The term exaflood derives from exabyte, which equals 1 quintillion bytes, or 1 followed by 18 zeros. As of December 2006, the Internet was handling 700 million gigabytes of traffic a month, according to the University of Minnesota's Digital Technology Center. A gigabyte is 1 billion bytes and 700 million billion bytes equals 700 quadrillion bytes, or 0.7 exabytes.

In and of itself, the exaflood does not necessarily present a crisis. Right now the global Internet has the capacity to handle the traffic. The question is, when the amount of Internet data truly begins to reach the capacity of the network, as it inevitably will, how will the industry be able to respond?

One obvious answer is to build more infrastructure. Optical transmission technology continues to improve and faster processors make for faster Internet switches and routers. Carriers have been doing as much all along. However, a second, complementary solution could be applied to the *transmission layer*--the internal software of the network that handles Internet data as it flows through. While indeed Internet transmission is all bits and bytes, intelligence in the transmission layer already can discern video from voice and text from image and prioritize them differently. Just as with physical infrastructure, scores of U.S. manufacturers are working to improve the performance of the transmission layer.

Trouble is, costs of the exaflood can not be avoided. In March 2006, Henry Kafka, Chief Architect at BellSouth (now AT&T) told attendees at the National Fiber Optic Engineers Conference that average residential broadband user was consuming about 2 gigabytes of data per month, which Kafka estimated costs the service provider about $1. As downloading feature films becomes more popular, users might consume an average of 9 gigabytes per month, costing carriers $4.50.

The average IPTV user, however, will likely consume about 224 gigabytes per month, Kafka said, at a monthly cost to carriers of $112. If that content were high-definition video, the average user would be consuming more than 1 terabyte per month at a cost to carriers of $560 per month.

"Clearly that's not what the average user is going to pay per month for their video service," Kafka said.[8]

Network neutrality would close off an important revenue stream for carriers—quality, reliability and partitioning services that very large applications providers will need for their services to work properly. This will chill investment and slow deployment. The overall utility of the Internet declines as it become clogged. Prices would remain for consumers because cost of managing congestion could not be transferred to the largest users of bandwidth. Although attacked as a "toll lane" on the Web, such paid partitioning will keep the standard transmission lanes—still extremely fast—cleared for less commercial and less bandwidth-intensive applications, resulting in a better functioning Internet for all. This will do more to ensure the Internet remains equally useful for all than regulating or banning Internet quality control.

Thank you.

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[8] Ed Gubbins, "OFC: BellSouth Chief Architect warns of HD VOD costs," Telephony Online, March 7, 2006; available at
http://telephonyonline.com/iptv/technology/BellSouth_VOD_costs_030706/index.html